ADDENDUM 2 TO GEN-07-ASAM-04

2-9 INSPECTION CRITERIA FOR IMAGE INTENSIFIER OPERATION

CAUTION

Keep the protective caps on the ANVIS whenever it is not in use. Operate the binocular only under darkened conditions.

a. General. As directed in the PMCS table, the image intensifier assembly's operation must be checked periodically. This section provides information for the ANVIS maintenance personnel concerning what to look for, how to look for it, and how to determine if the ANVIS needs to be repaired. All nonflyable conditions should be recorded on the appropriate maintenance forms and the specific defects described and located. While formal determination of a defective image intensifier assembly is made by AVIM personnel, the aviator is the ultimate person responsible for determining whether the image intensifier assembly operation interferes with his ability to perform his mission. If maintenance personnel determine that the image intensifier assembly performance meets the specification and the aviator still finds the performance interferes with his ability to perform the mission, the aviator must initiate the PQDR process by stating clearly on a DA Form 2408-30 that the problem interferes with the ability to perform the mission, sign it, and return the ANVIS to the maintainer.

There are two groups of "defects" you may encounter — operational defects and cosmetic blemishes. Operational defects are an immediate cause to reject the ANVIS. Cosmetic blemishes are not a cause for rejection unless they become severe enough to interfere with the operator's ability to perform the mission.

b. Operational Defects. These defects relate to the reliability of the image intensifier and are an indication of instability. If identified, they are an immediate cause for rejecting the ANVIS. They include Shading, Edge Glow, Flashing, Flickering, Intermittent Operation and Emission Points.

NOTE

Make sure the shading is not the result of improper tilt, eye-span adjustment, or vertical adjustment

(1) Shading. Each monocular should present a circular image. If shading is present, you will not see a fully circular image (Figure 2-1). Shading is indicative of a dying photocathode caused by a defective vacuum seal on the image intensifier. Shading is very dark and you cannot see an image through it. Shading always begins at the edge and migrates inward eventually across the entire image area. Shading is a high contrast area with a distinct line of demarcation. Do <u>not</u> confuse shading with variations in output brightness – refer to paragraph 2-9c(6). If shading is present, the image intensifier assembly must be replaced by AVIM.

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2-9 INSPECTION CRITERIA FOR IMAGE INTENSIFIER OPERATION - Continued

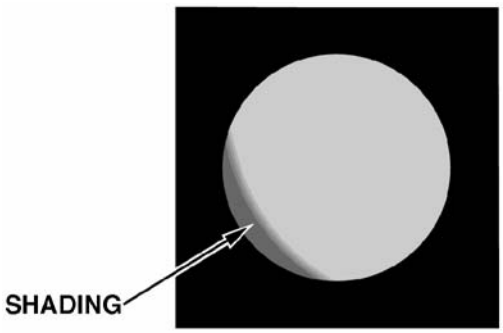

Figure 2-1. Shading.

(2) Edge Glow. Edge glow is a bright area (sometimes sparkling) in the outer portion of the viewing area (Figure 2-2). Edge glow is sometimes caused by an emission point (or series of emission points) just outside the field of view or by a defective phosphor screen that permits light feedback to the photocathode. To check for edge glow, remove the binocular from the test ports (keeping the goggle connector attached) and block out all light by cupping a hand over the lens. If the image tube is displaying edge glow, the bright area will still show up. If edge glow is present, record this specific defect on the maintenance forms. The image intensifier assembly must be replaced by AVIM.

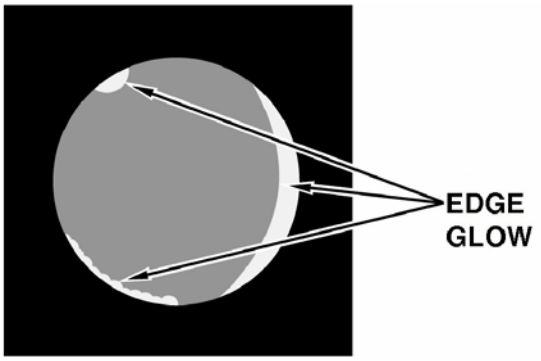

Figure 2-2. Edge Glow.

(3) Flashing, Flickering, or Intermittent Operation. The image may appear to flicker or flash. This can occur in either one or both monoculars. If there is more than one flicker, check for loose wires. Record this specific defect on the maintenance forms, and if possible, indicate the rate of flickering or flashing. The binocular must be repaired by AVIM.

(4) Emission Points. A steady or fluctuating pinpoint of bright light in the image area that does not go away when all light is blocked from the objective lens of that monocular (see Figure 2-3). The position of an emission point within the image area does not move. If a bright spot remains when you cup your hands over the objective lens (subparagraph 2-9c(1) below), place the goggles onto the TS-3895A/UV test set and

turn the selector knob to LOW LIGHT and note the point's location. Then turn the selector knob to HIGH LIGHT. If the emission point still exists and the tube is still under warranty, remove and return for warranty repair/replacement per paragraph 1-7.

2-9 INSPECTION CRITERIA FOR IMAGE INTENSIFIER OPERATION – Continued

c. Cosmetic Blemishes. These are usually the result of manufacturing imperfections that do not affect image intensifier reliability and are not normally a cause for rejection of ANVIS. However, some types of blemishes can get worse over time and interfere with the ability to perform the mission. If you believe a blemish is cause for rejection, record the specific nature of the problem on the maintenance forms and identify the position of the blemish by using the clock method and ring (e.g. 5 o'clock 1st ring, 2:30 center ring, 8:00 2nd ring). The following are cosmetic blemishes:

NOTE

Make sure any bright spots or emission points are not simply a bright area or point light source in the scene you are viewing.

(1) Bright Spots. These are signal-induced blemishes in the image area caused by a flaw in the film on the MCP. A bright spot is a small, nonuniform, bright area that may flicker or appear constant (Figure 2-3). Not all bright spots make an image intensifier rejectable. Remove the binocular from the test ports (keeping the goggle connector attached if using the TS-3895A/UV) and cup your hand over the lens to block out all light. If the spot remains, it is an emission point; refer to subparagraph 2-9b(4) above for evaluation. If the spot disappears, it is a bright spot. Place the goggles onto the TS-3895A/UV test set and turn the selector knob to HIGH LIGHT for 15 seconds and note the spot's location. Turn the selector knob to LOW LIGHT and wait another 15 seconds. If the spot disappears or is faintly visible, it is acceptable. If the spot interferes with the ability to perform the mission, AVIM must replace the image intensifier.

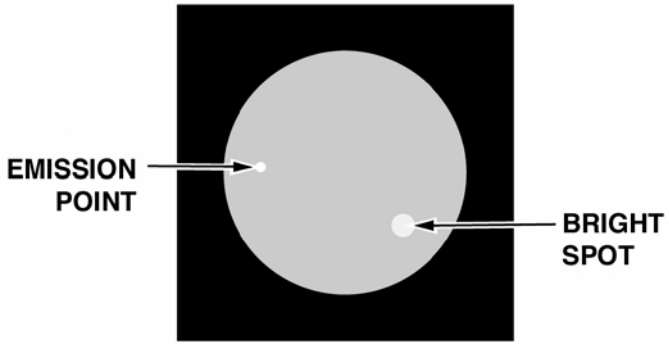

Figure 2-3. Bright Spots and Emission Points.

(2) Black Spots. These are cosmetic blemishes in the image intensifier or dirt or debris between the lenses. Black spots are acceptable as long as they do not interfere with viewing the image. No action is required if this condition is present unless the spots are deemed excessive by the user and the appropriate maintenance forms and

records are completed in accordance with DA Pam 738-751. Detailed procedures for evaluating black spots are contained in paragraph 2-10.

2-9 INSPECTION CRITERIA FOR IMAGE INTENSIFIER OPERATION - Continued

(3) Fixed-Pattern Noise (Honeycomb). This is a cosmetic blemish characterized by a faint hexagonal pattern throughout the viewing area that most often occurs at high light levels or when viewing very bright lights (Figure 2-4). This pattern can be seen in every image intensifier if the light level is high enough. This condition is acceptable as long as you can resolve the resolution target at the high light level. If it still remains when viewing at the low light level, AVIM must replace the image intensifier assembly.

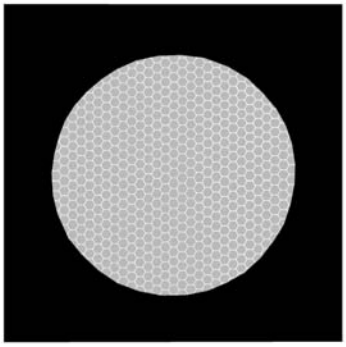

Figure 2-4. Fixed-Pattern Noise.

(4) Chicken Wire. An irregular pattern of dark thin lines in the field of view either throughout the image area or in parts of the image area (Figure 2-5). Under the worst case condition, these lines will form hexagonal or square-wave shaped patterns. These lines are caused by defective fibers that do not transmit light occurring at the boundaries of fiber bundles in the output optic of the image intensifier. No action is required if this condition is present unless the chicken wire is deemed excessive by the user and the appropriate maintenance forms and records are completed in accordance with DA Pam 738-751. In which case, AVIM must evaluate the system for further action.

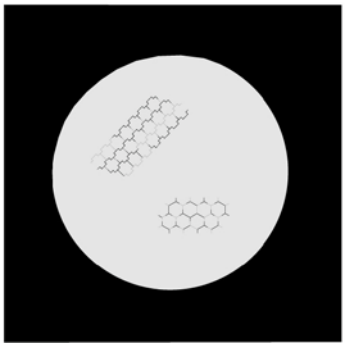

Figure 2-5. Chicken Wire.

2-9 INSPECTION CRITERIA FOR IMAGE INTENSIFIER OPERATION – Continued

(5) Image Disparity. This condition exists when there is a difference in brightness between the two image-intensifier assemblies within the same binocular. This condition is acceptable unless the difference is significant enough to interfere with the operator's ability to perform the mission. No action is required if this condition is present unless it is reported by the pilot in writing to interfere with viewing the image and to interfere with the ability to perform the mission. In which case, AVIM must replace an image intensifier assembly.

(6) Output Brightness Variation. This condition is evidenced by areas of varying brightness in or across the image area. The lower contrast areas do not exhibit distinct lines of demarcation, nor do they degrade image quality. Examples are light brush lines, streaking, or areas that look smeared. Do not confuse output brightness variation with shading — (paragraph 2-9b(1)). Output brightness variation is acceptable unless the operator deems that it interferes with the ability to perform the mission and the appropriate maintenance forms are completed in accordance with DA Pam 738-751.